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DAVID W. LYNCH
CHAMBLISS, BAHNER & STOPHEL
1000 TALLAN SQUARE-H
TWO UNION SQUARE
CHATTANOOGA, TN 37402

EXAMINER	
WATKO, JULIE ANNE	
ART UNIT	**PAPER NUMBER**
2627	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/814,716	LE, QUANG	
	Examiner	Art Unit	
	Julie Anne Watko	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *17-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2004 and 29 June 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/31/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of group I, claims 1-16, in the reply filed on September 1, 2006, is acknowledged.

2. Claims 17-31 are withdrawn from consideration as non-elected without traverse.

Information Disclosure Statement

3. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered. See especially pages 4-5 of the specification.

Drawings

4. The drawings were received on June 29, 2004. These drawings are not acceptable. See PTO-948 Notice of Draftsperson's Patent Drawing Review, attached.

5. The drawings filed March 31, 2004, are objected to because:

Numbers, letters and reference characters do not measure at least 1/8 inch in height. See 37 C.F.R. 1.84(p)(3).

The same figure is shown with two figure numbers. See page 5 of the drawings, which shows a single figure labeled as both "FIG. 7" and "FIG. 8".

Identifying indicia are not contained within the top margin. See especially page 6 of the drawings, in which the identifying indicia encroach upon Fig. 9. See 37 C.F.R. 1.84(c).

6. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

7. The disclosure is objected to because of the following informalities:

On page 13, line 23, the specification recites "alumina layer 119". This is inconsistent with the appearance of Fig. 6, in which 119 points to P2, which is inherently not made of alumina.

Different parts are referred to by the same reference numeral. For example, 132 represents both a "pole tip" (see page 16, line 2) and a "write pole sub" (see page 17, line 21). Reference numeral 305 represents both a "write gap" (see p. 19, line 19) and an "insulation layer" (see p. 16, line 1).

The specification fails to describe some parts shown in the Figures. See, e.g., the part below 140 in Fig. 6.

Appropriate correction is required.

8. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "recessed from the ABS" in line 3. There is insufficient antecedent basis for this limitation in the claims.

Claim 1 recites the limitation "a magnetic material disposed on top of the write pole sub layer" in line 8. It is unclear which of the disclosed layers is meant by this limitation. No such magnetic material is described for the disclosed product. The elected claims are drawn to the product.

Claim 1 recites the limitation "a laminated write pole layer, formed over the write pole sub layer" in line 9. This limitation is misdescriptive of the specification. It is unclear in what sense the laminated write pole layer is "over" the write pole sub layer, based upon the

appearance of the figures, none of which shows the laminated write pole layer "over" the write pole sub layer.

Claim 9 contains similar recitations and is similarly indefinite.

Claim 7 recites the limitation "the fourth stud segments and the trailing shield" in line 2. There is insufficient antecedent basis for this limitation in the claims.

Claim 15 contains similar recitations and is similarly indefinite.

Claim 8 recites the limitation "the pole tip" in line 1. There is insufficient antecedent basis for this limitation in the claims.

Claim 16 contains similar recitations and is similarly indefinite.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-16, to the extent understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Narumi et al (US Pat. No. 7110218 B2) in view of Shukh et al (US Pat. No. 6954340 B2).

The product by process limitations in these claims are directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessman*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it

clear that it is the patentability of the final structure of the product "gleaned" from the process limitations or steps, which must be determined in a "product by process" claim, and not the patentability of the process limitations. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear.

Similar claims are treated together.

As recited in claims 1 and 9, to the extent understood, Narumi et al show a write head (see Fig. 4(a), for example) including: a first and second ferromagnetic pole piece (1 and 2, respectively), the second pole piece 2 with a front end (left end in Fig. 4(a)) recessed from the ABS (left surface in Fig. 4(a)) and magnetically connected to a back gap 4 magnetically coupling the first and second pole pieces (1 and 2); a coil structure 3 between the first and second ferromagnetic pole piece (1 and 2); a write pole sub layer 11, formed over (to the extent understood) the second pole piece, the write pole sub layer having a taper (see Fig. 1(b), for example) at a pole tip region toward the air bearing surface (ABS); a magnetic material disposed on top of the write pole sub layer (this limitation is misdescriptive); a laminated write pole layer 11, formed over (this limitation is indefinite) the write pole sub layer 11, the laminated write pole layer formed of high magnetic saturation material (112 and 111; "saturation magnetic flux density of the magnetic layer consisting of the magnetic pole tip layer is not less than 1.6 T", see col. 7, lines 12-13) with interspersed non-magnetic film 10 magnetically coupled with the write pole sub layer; a laminated write pole 11 shaped from (to the extent understood) the laminated write pole layer 11; a non-magnetic material 8 encapsulating the write pole.

As recited in claim 9, Narumi et al show a magnetic head assembly that has a head surface (left surface in Figs. 1(a)-6(b)).

As recited in claim 9, Narumi et al are silent regarding a read head and a perpendicular recording write head, comprising: the read head including: ferromagnetic first and second shield layers; and a read sensor located between the first and second shield layers; a ferromagnetic write shield layer disposed over the non-magnetic material encapsulating the write pole; and at least one ferromagnetic stud magnetically connecting the first pole piece and the write shield layer.

As recited in claim 9, Shukh et al show (see Fig. 15, for example) a read head and a perpendicular recording write head ("write heads for high areal density recording on double layer perpendicular media", see col. 1, lines 14-15), comprising: the read head including: ferromagnetic first and second shield layers (56 and 62); and a read sensor (57) located between the first and second shield layers; a ferromagnetic write shield layer 52 disposed over the non-magnetic material encapsulating (see 43, 44 and 53) the write pole 51; and at least one ferromagnetic stud 59 magnetically connecting the first pole piece 62 and the write shield layer 52.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the read head and read shields of Shukh et al to the write head of Narumi et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to add the read head to the write head in order to increase read sensitivity by using the giant magnetoresistive effect instead of reading with the inductive head, and to prevent misreading by

accidental reading of adjacent tracks or stray magnetic fields as is notoriously well known in the art.

It would have been further obvious to one of ordinary skill in the art at the time the invention was made to make the head of Narumi et al into a perpendicular recording head as taught by Shukh et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to increase a recording density and storage capacity as taught by Shukh et al (see col. 1, lines 22-38).

It would have been further obvious to one of ordinary skill in the art at the time the invention was made to add the shield and studs of Shukh et al to the head of Narumi et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to suppress side writing as taught by Shukh et al (see col. 2, lines 42-45).

As recited in claims 2 and 10, Narumi et al are silent regarding whether the write pole further comprises a trapezoidal shape to prevent adjacent track writing when skew is experienced while flying over the disk.

As recited in claims 2 and 10, Shukh et al show that the write pole further comprises a trapezoidal shape to prevent adjacent track writing when skew is experienced while flying over the disk.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the trapezoidal shape of Shukh et al to the write pole of Narumi et al as taught by Shukh et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to apply the trapezoidal shape in order to control the track width so as to eliminate a

skew effect and further reduce side writing as taught by Shukh et al (see col. 1, lines 57-59; see also col. 2, lines 33-41).

As recited in claims 3 and 11, Narumi et al show that the laminated write pole 11 includes a tapered portion (see shape of 11 in Fig. 1(b), for example).

As recited in claims 4 and 12, Narumi et al show that the encapsulating non-magnetic material further comprises a RIEable material (see Fig. 3(c), which shows that the non-magnetic material encapsulating 11 has been reactive ion etched with 11).

As recited in claims 5 and 13, Narumi et al show that the RIEable material is selected from a group of materials comprising TaOx, SiO_2, Si_3N_4, Ta, W, Al_2O_3 (see col. 4, line 51, "Al_2O_3, SiO_2").

As recited in claims 6 and 14, Narumi et al are silent regarding a write gap layer of non-magnetic materials formed on the top of the write pole layer.

As recited in claims 6 and 14, Shukh et al show a write gap layer 53 of non-magnetic materials formed on the top of the write pole layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the write gap layer of Shukh et al to the write head of Narumi et al as modified above. The rationale is as follows: one of ordinary skill in the art would have been motivated to add the write gap layer in order to magnetically isolate the write pole from the write shield as is notoriously well known in the art.

As recited in claims 7 and 15, to the extent understood, Narumi et al show an overcoat 8.

As recited in claims 8 and 16, to the extent understood, Narumi et al show that the pole tip 11 is laterally surrounded by a non-magnetic material (see Fig. 3(c)).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sato et al (US Pat. No. 6922316 B2) show a thin film magnetic head (see Fig. 6) comprising laminate (14A and 15) having a taper (see Figs. 2-3).

Sasaki et al (US Pat. No. 6762911 B2) show a thin film magnetic head comprising laminate (see Figs. 14, 21 and 27, for example).

Mochizuki et al (US PAP No. 20060198050 A1) and Kimura et al (US PAP No. 20050162778 A1) were filed after Applicant's filing date.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie Anne Watko whose telephone number is (571) 272-7597. The examiner can normally be reached on Monday-Friday, 10AM to 5PM and all day Saturday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne D. Bost can be reached on (571) 272-7023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Julie Anne Watko, J.D.
Primary Examiner
Art Unit 2627

March 22, 2007
JAW